

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Patient Punctuality and Clinic Performance: Observations From an Academic-Based Private Practice Pain Centre -A Prospective Quality Improvement Study Research Article
AUTHORS	Williams, Kayode; Chambers, Chester; Dada, Maqbool; McLeod, Julia; Ulatowski, John

VERSION 1 - REVIEW

REVIEWER	ZHU Zhecheng Health Services & Outcomes Research, National Healthcare Group, Singapore
REVIEW RETURNED	19-Feb-2014

GENERAL COMMENTS	<p>The method and results parts need major revision.</p> <p>Methods:</p> <ol style="list-style-type: none">1. Figure 2 is not clear. (the 50% is not mentioned in main text and reflected in the simulation model)2. An illustration of the DES model would be helpful.3. A chart to clearly explain early, late, tardy, wait, delay and makespan4. Is parameters in Table 1 complete. How about the distribution of earliness and lateness? Any no-show? <p>Results:</p> <ol style="list-style-type: none">1. Is Table 2 simulation results or observation? Need clarification2. Table 3 and 4 not clear. Need to define the simulation scenarios clearly before presenting results.
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REVIEWER	Xiuli Qu North Carolina A&T State University United States
REVIEW RETURNED	19-Mar-2014

GENERAL COMMENTS	<p>The results in this paper provide outpatient clinics an effective intervention to improving patient punctuality, and further improving clinic performance. However, the reviewer has only one concern about the assumption in the discrete-event simulation model, which is that activity times are assumed with a Beta distribution. In most patient flow simulation models in the literature, it was assumed that activity times followed Lognormal, Weibull or Gamma distributions. For example, Reference [17] cited in this paper assumed Lognormal, Weibull and Gamma distributed activity times. The authors should justify why they assumed Beta distributed activity times in the simulation model. In addition, the reviewer has the following</p>
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	<p>comments for minor changes:</p> <ul style="list-style-type: none"> • In Table 3 on page 15, FT Arrival and FT Appt should be defined. • The standard errors of performance metrics from simulation were provided only in text. It is better to summarize and include the standard errors in the result tables (Tables 2, 3, and 4). • In the following sentence in lines 13-15 of page 17, it is not clear why 1.62 min was chosen as a criterion. “The only changes in values of WAIT or DELAY for a group that are more than 1.62 min are the reductions in WAIT and DELAY for group L1.” • In the last sentence on page 21, “... have to potential ...” should be replaced with “... have potential ...” <p>In this paper, the authors presented the effects of an intervention in which patients were informed that late arrivals would not be seen and would be re-scheduled. Their results showed that after 12 months of implementing the intervention, the percentage of patients who are tardy dropped from 7.7% to 1.5%, and the average tardiness decreased from 16.75 minutes to 2 minutes. These results supported that the intervention improves patient punctuality. Furthermore, the authors developed a discrete-event simulation model to investigate the relationship between patient punctuality and clinic performance. Their simulation results showed that reducing patient unpunctuality reduces delays and session completion times, and that the physician's willingness to see patients early improves clinic performance. The results in this paper provide outpatient clinics an effective intervention to improving patient punctuality, and further improving clinic performance. However, the reviewer has only one concern about the assumption in the discrete-event simulation model, which is that activity times are assumed with a Beta distribution. In most patient flow simulation models in the literature, it was assumed that activity times followed Lognormal, Weibull or Gamma distributions. For example, Reference [17] cited in this paper assumed Lognormal, Weibull and Gamma distributed activity times. The authors should justify why they assumed Beta distributed activity times in the simulation model. In addition, the reviewer has the following comments for minor changes:</p> <ul style="list-style-type: none"> • In Table 3 on page 15, FT Arrival and FT Appt should be defined. • The standard errors of performance metrics from simulation were provided only in text. It is better to summarize and include the standard errors in the result tables (Tables 2, 3, and 4). • In the following sentence in lines 13-15 of page 17, it is not clear why 1.62 min was chosen as a criterion. “The only changes in values of WAIT or DELAY for a group that are more than 1.62 min are the reductions in WAIT and DELAY for group L1.”
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	<ul style="list-style-type: none"> • In the last sentence on page 21, "... have to potential ..." should be replaced with "... have potential ..."
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VERSION 1 – AUTHOR RESPONSE

Response to Reviewer #1

BMJ Open – ID bmjopen-2013-004679

Dear Dr.Zhu,

My co-authors and I would like to thank you for your very thorough review of our manuscript and extremely helpful comments and recommendations. Please find below our responses to your comments. We hope that this revised submission satisfies your concerns and that you will agree that this new version of the paper warrants publication.

Very Respectfully

Kayode Williams

Methods

Comment 1. Figure 2 is not clear. (the 50% is not mentioned in main text and reflected in the simulation model)

Response: The omission from the main text has been corrected. The Attending Physician (AP) is needed in 50% of type 3 cases for a short consult with the Physician's Assistant (PA). It was always present in all simulations, just not noted in the text. No results are affected – only the description of the process flow.

Comment 2. An illustration of the DES model would be helpful.

Response: Since the DES is easier to follow in a video form, rather than a simple pic, we added a link to a video describing the model itself into the text. This way interested parties can literally see the model run, and the length of the submission is not extended.

Comment 3. A chart to clearly explain early, late, tardy, wait, delay and makespan

Response: This has been addressed in two steps. First, British journals prefer the term "tardy" to the term "late" which would be common in American journals. Therefore, the term "late" has been changed to "tardy". The definitions of WAIT and DELAY have been clarified in the text as well as in the legends of the tables where they first appear.

Comment 4. Is parameters in Table 1 complete. How about the distribution of earliness and lateness? Any no-show?

Response: Parameters in Table 1 are complete. The distributions of earliness and tardiness are described in Table 2. All data reported in Tables 1 and 2 are from direct observations of the clinic. All

data in Tables 3 and 4 are from simulations. This has been explained in the text and is now noted in the titles of the tables as well. The No-show rate was 28% but did not change over the course of the study.

Results

Comment 1. Is Table 2 simulation results or observation? Need clarification

Response: Table 2 is from direct observation of the clinic. This is noted in the text. Table 2 has also been moved so that it follows this description to help eliminate any confusion.

Comment 2. Table 3 and 4 (are) not clear. Need to define the simulation scenarios clearly before presenting results.

Response: Again, this was primarily an issue of placement of the table. It has been moved to follow the description to make things more clear.

Response to Reviewer #2

BMJ Open – ID bmjopen-2013-004679

Dear Dr. Xiuli Qu,

My co-authors and I would like to thank you for your very thorough review of our manuscript and extremely insightful comments and recommendations. Please find below our responses to your comments. We hope that this revised submission satisfies your concerns and that you will agree that this new version of the paper warrants publication.

Very Respectfully

Kayode Williams

Comment 1. However, the reviewer has only one concern about the assumption in the discrete-event simulation model, which is that activity times are assumed with a Beta distribution...The authors should justify why they assumed Beta distributed activity times.

Response: This choice stems from three factors. First, the analysis is using a simulation model that the authors developed and published previously when considering different issues. Therefore, we wanted the models to be consistent. Second, observed activity times are bounded from above and below – meaning they have definite minimums and maximums. Using Beta distributions allows us to match these values. This cannot be done using unbounded distributions such as Log-normal or Gamma. Third, the use of Beta distributions offers another important advantage in that it can take many shapes, as driven by the collected data. This flexibility is illustrated in the sample pdfs plotted below.

Please see uploaded file for graphs.

As shown, the Beta distribution can look very similar to a Log-normal, Weibull, or Gamma. However, it can also take on more complex shapes as needed. The Beta distribution is used frequently in the literature on Project Management and has been extensively studied and tested. We realize it is somewhat novel in this literature, but it is quite useful because of its flexibility, and we hope that our work brings this to the attention of other researchers in the healthcare field as well. For more details please see, http://en.wikipedia.org/wiki/Beta_distribution

Comment 2. In Table 3 on page 15, FT Arrival and FT Appt should be defined

Response: The needed additions to the table have been made

Comment 3. The standard errors of performance metrics from simulation were provided only in text. It is better to summarize and include the standard errors in the results tables

Response: For simulation results, the STD values are given for each variable. Since this is a simulation the number of observations n is fixed at 10000. Since the tables are only reporting means, the standard error is simple $s/(n)^{0.5}$. We left it out because, it is generally not very informative. The error can be made arbitrarily small by increasing n . On the other hand, the statistical test showing a reduction in average unpunctuality is not from simulation and the error there has been reported more precisely in the text.

Comment 4. In the following sentence in lines 13-15 of page 17, it is not clear why 1.62 min was chosen as a criterion. "The only changes in values of WAIT or DELAY for a group that are more than 1.62 min are the reduction in WAIT and DELAY for group L1.

Response: This sentence created more confusion than new information and has been dropped. The only point was that WAIT and DELAY are only sharply changed for group L1. This is now simply stated and left at that.

Comment 5. In the last sentence on page 21, "... have to potential..." should be replaced with "...have potential..."

Response: This has been corrected in the revised text.